UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Mr. Larry Lawson, Director
Division of Water Program Coordination
Virginia Department of Environmental Quality
629 Main Street
Richmond, VA 23219

Dear Mr. Lawson:

The Environmental Protection Agency (EPA) Region III is pleased to approve the Total Maximum Daily Loads (TMDLs) report for the primary contact use (bacteria) impairments in the Tinker Creek Watershed. The TMDLs were submitted to EPA for review in April 2004. The TMDLs were established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address an impairment of water quality as identified in Virginia's 1998 Section 303(d) list.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) designed to attain and maintain the applicable water quality standards, (2) include a total allowable loading and as appropriate, wasteload allocations (WLAs) for point sources and load allocations for nonpoint sources, (3) consider the impacts of background pollutant contributions, (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated), (5) consider seasonal variations, (6) include a margin of safety (which accounts for uncertainties in the relationship between pollutant loads and instream water quality), (7) consider reasonable assurance that the TMDL can be met, and (8) be subject to public participation. The enclosure to this letter describes how the TMDLs for the primary contact use impairments satisfy each of these requirements.

Following the approval of these TMDLs, Virginia shall incorporate the TMDLs into the appropriate Water Quality Management Plans pursuant to 40 CFR § 130.7(d)(2). As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL WLA pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

If you have any questions or comments concerning this letter, please don't hesitate to contact Mr. Thomas Henry at (215) 814-5752.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division

Enclosure

Decision Rationale

Total Maximum Daily Loads for
the Primary Contact Use (Bacteriological) Impairments in the Tinker Creek Watershed

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those water bodies identified as impaired by a state where technology-based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a margin of safety (MOS), that may be discharged to a water quality-limited water body.

This document will set forth the Environmental Protection Agency's (EPA's) rationale for approving the TMDLs for the primary contact use (bacteriological) impairments on Cravin Creek, Glade Creek, Laymantown Creek, Lick Run and Tinker Creek (Tinker Creek Watershed). EPA's rationale is based on the determination that the TMDLs meet the following eight regulatory conditions pursuant to 40 CFR §130.

1) The TMDLs are designed to implement applicable water quality standards.
2) The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.
3) The TMDLs consider the impacts of background pollutant contributions.
4) The TMDLs consider critical environmental conditions.
5) The TMDLs consider seasonal environmental variations.
6) The TMDLs include a margin of safety.
7) There is reasonable assurance that the TMDLs can be met.
8) The TMDLs have been subject to public participation.

II. Background

The Tinker Creek Watershed is located in Botetourt and Roanoke Counties, Virginia. The Tinker Creek Watershed is 71,500 acres in size. The watershed is split between agricultural (22 percent), developed (20 percent) and forested (54 percent) lands. There are four tributaries to Tinker Creek which are failing to attain their primary contact use as well. Table 1 identifies the impaired segments within the watershed and the date of their initial Section 303(d) listing.

Table 1 - Impaired Segments in the Tinker Creek Watershed

Stream	Segment	Listing	Miles	Location
Carvin Creek	VAW-L05R	2002	5.35	Upstream of I-81 at mouth of unnamed tributary to mouth of Carvin Creek
Laymantown Creek	VAW-L05R	2002	2.08	Upstream of Route 657 Bridge at small pond to mouth of Laymantown Creek
Glade Creek	VAW-L05R	1998	12.61	Headwaters to mouth of Glade Creek
Lick Run	VAW-L05R	1996	3.5	Shaffer Crossing Rail Yard to mouth of Lick Run
Tinker Creek	VAW-L05R	1996	19.38	Headwaters of Tinker Creek to mouth of Tinker Creek

All of the waters identified in Table 1 were listed on Virginia's Section 303(d) list for failing to meet the primary contact use based on the fecal coliform criteria. Fecal coliform is a bacterium which can be found within the intestinal tract of all warm blooded animals. Fecal coliform in itself is not a pathogenic organism. However, fecal coliform indicates the presence of fecal wastes and the potential for the existence of other pathogenic bacteria. The higher concentrations of fecal coliform indicate the elevated likelihood of increased pathogenic organisms. All of these streams violated the old fecal coliform criteria greater than 10 percent of the time.

EPA has been encouraging the states to use e-coli and enterococci as the indicator species instead of fecal coliform. A better correlation has been drawn between the concentrations of e-coli and enterococci, and the incidence of gastrointestinal illness. The Commonwealth adopted e-coli and enterococci criteria in January 2003. Streams are evaluated via the e-coli and enterococci criteria after 12 samples have been collected using these indicator species. The Tinker Creek watershed is now assessed through the e-coli criteria.

As Virginia designates all of its waters for primary contact, all waters must meet the current fecal coliform standard for primary contact. Virginia's standard applies to all streams designated as primary contact for all flows. The new e-coli criteria requires a geometric mean concentration of 126 cfu/100ml of water with no sample exceeding 235 cfu/100ml of water. Unlike the updated fecal coliform criteria which allows a 10 percent violation rate, the new e-coli criteria requires the concentration of e-coli to not exceed 235 cfu/100ml of water.

Although, the TMDL and criteria require the 235 cfu/100ml of water not to be exceeded, waters are not placed on the Section 303(d) list if their violation rate does not exceed 10 percent. Therefore, the Creeks may be deemed as attaining their uses prior to the implementation of all of the TMDL reductions. It is necessary to keep this in mind because of the stringent reductions needed to attain the instantaneous criteria for e-coli. An increase in the violation rate has been seen in all of the monitoring stations with the application of the new criteria.

The TMDLs submitted by Virginia are designed to determine the acceptable load of fecal coliform which can be delivered to the impaired waters, as demonstrated by the Hydrologic

Simulation Program Fortran (HSPF)[1], in order to ensure that the water quality standard is attained and maintained. HSPF is considered an appropriate model to analyze these impaired waters because of its dynamic ability to simulate both watershed loading and receiving water quality over a wide range of conditions.

The model allocates the application/deposition of fecal coliform to land based and instream sources. For land based sources, the HSPF model accounts for the buildup and washoff of pollutants from these areas. Buildup (accumulation) refers to all of the complex spectrum of dry-weather processes that deposit or remove (die-off) pollutants between storms.[2] Washoff is the removal of fecal coliform which occurs as a result of runoff associated with storm events. These two processes allow the HSPF model to determine the amount of fecal coliform from land based sources which is reaching the stream. Point sources and wastes deposited directly to the stream were treated as direct deposits. Wastes which are deposited directly to the stream do not need a transport mechanism.

Local rainfall and temperature data were needed to develop the model. Weather data provides the rainfall data which drives the TMDL model. Hourly weather data was obtained from the Roanoke Airport weather station.

Several United States Geological Survey (USGS) gauges were located on Tinker Creek. These USGS gauges (02055100, 02055000, and 02056000) were used to calibrate the hydrology component of the model. The calibration for the Tinker Creek watershed was from October 1993 through September 1998. The simulated results of the model were compared with observed data from the USGS gauges. The model parameters were adjusted until the accurately reflected the observed gauge data. The hydrology model was then validated for a separate five year period from October 1988 through September 1993. During the validation process the parameters are frozen to see how well the model simulated observed conditions over the new data period. The model performed well in both the calibration and validation.

The water quality model was next developed for the watershed and was calibrated to sampling data obtained from VADEQ's water quality monitoring stations. The calibration period was from October 1992 through September 1997. During the calibration, the loading parameters were adjusted to create a simulation that accurately predicted observed conditions. The water quality calibration was calibrated to data collected from October 1997 through September 2001. The water quality model was developed for fecal coliform concentrations since fecal coliform represented most of the available water quality data and most loading assumptions are based on fecal coliform. The fecal coliform concentrations were then converted to e-coli

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[1]Bicknell, B.R., J.C. Imhoff, J.L. Little, and R.C. Johanson. 1993. Hydrologic Simulation Program-FORTRAN (HSPF): User's Manual for release 10.0. EPA 600/3-84-066. U.S. Environmental Protection Agency, Environmental Research Laboratory, Athens, GA.

[2]CH2MHILL, 2000. Fecal Coliform TMDL Development for Cedar, Hall, Byers, and Hutton Creeks Virginia,

concentrations using a translator equation developed by VADEQ. Based on the HSPF model, the TMDL loadings documented in Table 2 will allow for the attainment of both the instantaneous and geometric mean criteria.

Table 2 - Summarizes the Specific Elements of the TMDLs.

Segment	Parameter	TMDL (cfu/yr)	WLA (cfu/yr)	LA (cfu/yr)	MOS
Carvin Creek	E-Coli	3.14E+13	5.24E+12	2.61E+13	Implicit
Glade Creek	E-Coli	4.24E+13	4.00E+11	4.20E+13	Implicit
Laymantown Cr	E-Coli	6.58E+12	4.36E+11	6.15E+12	Implicit
Lick Run	E-Coli	1.31E+13	7.17E+10	1.31E+13	Implicit
Tinker Creek	E-Coli	8.07E+13	5.07E+12	7.53E+13	Implicit

Through the development of these and other similar TMDLs, it was discovered that natural conditions (wildlife contributions to the streams) could cause or contribute to violations of the bacteria criteria. Bacterial source tracking sampling data collected within the Tinker Creek Watershed indicated that bacteria from wildlife represents a significant portion of the total load. Many of Virginia's TMDLs, including the TMDL for the Tinker Creek Watershed, have called for some reduction in the amount of wildlife contributions to the impacted streams. EPA believes that a significant reduction in wildlife is not practical and will not be necessary due to the implementation plan discussed below.

A phased implementation plan will be developed for all streams in which the TMDL calls for reductions in wildlife. In Phase 1 of the implementation, the Commonwealth will begin implementing the reductions (other than wildlife) called for in the TMDL. In Phase 2, which can occur concurrently to Phase 1, the Commonwealth will consider addressing its standards to accommodate this natural loading condition. The Commonwealth has indicated that during Phase 2, it may develop a Use Attainability Analysis (UAA) for streams with wildlife reductions which are not used for frequent bathing. Depending upon the result of the UAA, it is possible that these streams could be designated for secondary contact.

After the completion of Phase 1 of the implementation plan, the Commonwealth will monitor the stream to determine if the wildlife reductions are actually necessary, as the violation level associated with the wildlife loading may be smaller than the percent error of the model. In Phase 3, the Commonwealth will investigate the sampling data to determine if further load reductions are needed in order for these waters to attain standards. If the load reductions and/or the new application of standards allow the stream to attain standards, then no additional work is warranted. However, if standards are still not being attained after the implementation of Phases 1 and 2, further work and reductions will be warranted. The United States Fish and Wildlife Service has been provided with copy of these TMDLs.

III. Discussion of Regulatory Conditions

EPA finds that Virginia has provided sufficient information to meet all of the eight basic requirements for establishing a primary contact (bacteriological) impairment TMDLs for the Tinker Creek Watershed. EPA is therefore approving these TMDLs. EPA's approval is outlined according to the regulatory requirements listed below.

1) The TMDLs are designed to meet the applicable water quality standards.

Virginia has indicated that excessive levels of fecal coliform due to nonpoint sources (both wet weather and directly deposited nonpoint sources) have caused violations of the water quality criteria and designated uses in the Tinker Creek Watershed. The water quality criterion for fecal coliform was a geometric mean 200 cfu/100ml or an instantaneous standard of no more than 1,000 cfu/100ml. Two or more samples over a thirty-day period are required for the geometric mean standard. Since the state rarely collects more than one sample over a thirty-day period, most of the samples were measured against the instantaneous standard. The Commonwealth has changed its bacteriological criteria as indicated above. The new criteria require that the fecal coliform concentration not exceed a geometric mean of 200 cfu/100ml of water for two or more samples collected over a month nor shall more than 10% of the total samples exceed 400 cfu/100ml of water. The new e-coli criteria requires a geometric mean of 126 cfu/100ml of water with no sample exceeding 235 cfu/100ml. The violation rate in all of the impaired waters increased with the adoption of the new criteria.

The HSPF model is being used to determine the fecal coliform deposition rates to the land as well as loadings to the stream from point and other direct deposit sources necessary to support the e-coli water quality criterion and primary contact use. The following discussion is intended to describe how controls on the loading of e-coli to the Tinker Creek Watershed will ensure that the criterion is attained.

The TMDL modelers determine the fecal coliform production rates within the watershed. Data used in the model was obtained from a wide array of sources, including farm practices in the area, the amount and concentration of farm animals, point sources in the watershed, animal access to the stream, wildlife in the watershed, wildlife fecal production rates, landuses, weather, stream geometry, etc.. The model then combines all the data to determine the hydrology and water quality of the stream.

The lands within the watershed were categorized into specific landuses. The landuses had specific loading rates and characteristics that were defined by the modelers. Therefore, the loading rates are different for the various landuses. Pasture lands support cattle and are influenced differently by stormwater runoff than forested lands. The model was run using the weather data collected from Roanoke Airport. This data was used to determine the precipitation rates in the watersheds which transport the on land pollutants to the streams through overland and groundwater flows.

Several United States Geological Survey (USGS) gauges were located on Tinker Creek. These USGS gauges (02055100, 02055000, and 02056000) were used to calibrate the hydrology

component of the model. The calibration for the Tinker Creek watershed was from October 1993 through September 1998. The simulated results of the model were compared with observed data from the USGS gauges. The model parameters were adjusted until the accurately reflected the observed gauge data. The hydrology model was then validated for a separate five year period from October 1988 through September 1993. During the validation process, the parameters are frozen to see how well the model simulated observed conditions over the new data period. The model performed well in both the calibration and validation.

The water quality model was next developed for the watershed and was calibrated to sampling data obtained from VADEQ's water quality monitoring stations. The calibration period was from October 1992 through September 1997. During the calibration, the loading parameters were adjusted to create a simulation that accurately predicted observed conditions. The water quality calibration was calibrated to data collected from October 1997 through September 2001. The water quality model was developed to fecal coliform concentrations since fecal coliform represented most of the available water quality data and most loading assumptions are based on fecal coliform. The fecal coliform concentrations were then converted to e-coli concentrations using a translator equation developed by VADEQ. Based on the HSPF model, the TMDL loadings documented in Table 2 will allow for the attainment of both the instantaneous and geometric mean criteria. The instantaneous criteria requires that all flows have an e-coli concentration less than 235 cfu/100ml. This criteria is extremely stringent because it requires the allocations be developed for sporadic high violations.

2) The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.

Total Allowable Loads

Virginia indicates that the total allowable loading is the sum of the loads allocated to land based precipitation driven nonpoint source areas (forest and agricultural land segments) and point sources. Activities that increase the levels of bacteria to the land surface or their availability to runoff are considered flux sources. The actual value for total loadings can be found in Table 2 of this document. The total allowable loads were calculated on an annual basis.

Waste Load Allocations

Virginia has stated that there are several regulated point sources discharging within the Tinker Creek Watershed which are controlled for e-coli in their effluent. Four of these facilities are municipal separate storm sewer systems (MS4s), these systems are dedicated to the collection and discharge of stormwater. The MS4 systems are Botetourt County, Roanoke City, Roanoke County and Vinton. The loadings are determined based on the annual flow originating from the urbanized lands within these jurisdictions and their allowable bacteria concentration. The remaining dischargers are traditional National Pollutant Discharge Elimination System (NPDES) permitted facilities. These facilities have a permitted or design flow and a permitted bacteria concentration. The loading from these three facilities can be determined by multiplying their flows by their permitted effluent concentration (126 cfu/100ml) by 365 days.

EPA regulations require that an approvable TMDL include individual waste load allocations (WLAs) for each point source. According to 40 CFR 122.44(d)(1)(vii)(B), "Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA pursuant to 40 CFR 130.7." Furthermore, EPA has authority to object to the issuance of any NPDES permit that is inconsistent with the WLAs established for that point source.

Table 2 - Bacteriological (E-Coli) WLAs for Tinker Creek Watershed

Facility Name	Permit Number	Allocated Load (cfu/yr)
R W Bowers	VAG402061	1.10E+10
R W Bowers	VAG402059	1.10E+10
R W Bowers	VAG402063	1.10E+10
Botetourt County	VAR040023	2.63E+12
Roanoke City	VAR040004	3.46E+12
Roanoke County	VAR040022	4.68E+12

Vinton	VAR040026	4.29E+11

Load Allocations

According to Federal regulations at 40 CFR 130.2(g), load allocations (LAs) are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting loading. Wherever possible, natural and nonpoint source loads should be distinguished.

In order to accurately simulate landscape processes and nonpoint source loadings, VADEQ used the HSPF model to represent the impaired watersheds. The HSPF model is a comprehensive modeling system for the simulation of watershed hydrology, point and nonpoint source loadings, and receiving water quality. HSPF uses precipitation data for continuous and storm event simulation to determine total loading to the impaired segments from the various land uses within the watershed. Tables 3a, 3b, 3c, 3d and 3e list the LAs for the impaired waters. Significantly smaller reductions to the load from forested lands and wildlife in streams are required to meet the 10 percent violation rate required for Section 303(d) listing purposes.

Table 3a - LA for Bacteria (fecal coliform) for Carvin Creek

Source Category	Existing Load (cfu/yr)	Proposed Load (cfu/yr)	Percent Reduction
Cattle Direct Deposit	3.65E+11	0.00	100
Wildlife Direct Deposit	1.36E+14	3.40E+13	75
Straight Pipes	3.84E+13	0.00	100

Barren	1.77E+13	1.77E+12	90
Cropland	4.80E+12	4.80E+11	90
Commercial	1.02E+14	1.02E+13	90
Forest	2.59E+15	3.89E+14	85
Residential	6.46E+14	6.46E+13	90
Livestock Access	1.43E+13	1.43E+12	90
Pasture	2.87E+14	2.87E+13	90
Wetlands	2.63E+12	3.95E+11	85

Table 3b - LA for Bacteria (fecal coliform) for Glade Creek

Source Category	Existing Load (cfu/yr)	Proposed Load (cfu/yr)	Percent Reduction
Cattle Direct Deposit	5.50E+12	0.00	100
Wildlife Direct Deposit	1.40E+14	2.10E+13	85
Straight Pipes	1.47E+13	0.00	100
Barren	3.66E+13	1.46E+12	96
Commercial	9.96E+13	3.98E+12	96
Cropland	2.07E+13	8.28E+11	96
Forest	1.96E+15	1.76E+14	91
Residential	8.07E+14	3.23E+13	96

Livestock Access	5.00E+13	2.00E+12	96
Pasture	1.31E+15	5.24E+13	90
Wetlands	8.86E+11	7.97E+10	91

Table 3c - LA for Bacteria (fecal coliform) for Laymantown Creek

Source Category	Existing Load (cfu/yr)	Proposed Load (cfu/yr)	Percent Reduction
Cattle Direct Deposit	4.56E+11	0.00	100
Wildlife Direct Deposit	2.50E+13	3.00E+12	88
Straight Pipes	4.29E+11	0.00	100
Barren	3.45E+12	1.73E+11	95

Commercial	1.36E+12	6.80E+12	95
Cropland	3.72E+12	1.86E+11	95
Forest	4.00E+14	3.20E+13	92
Residential	9.75E+13	4.88E+12	95
Livestock Access	7.23E+12	3.62E+11	95
Pasture	1.86E+14	9.30E+12	95

Table 3d - LA for Bacteria (fecal coliform) for Lick Run

Source Category	Existing Load (cfu/yr)	Proposed Load (cfu/yr)	Percent Reduction
Cattle Direct Deposit	0.00	0.00	100

Wildlife Direct Deposit	5.34E+13	8.01E+12	85
Straight Pipes	1.40E+13	0.00	100
Commercial	3.37E+14	3.37E+12	99
Cropland	1.32E+12	1.19E+11	91
Forest	1.25E+14	2.50E+13	80
Residential	1.13E+15	1.13E+13	99
Livestock Access	1.73E+12	1.56E+11	91
Pasture	9.59E+13	8.63E+12	91
Wetlands	4.54E+11	9.08E+10	80

Table 3e - LA for Bacteria (fecal coliform) for Tinker Creek

Source Category	Existing Load (cfu/yr)	Proposed Load (cfu/yr)	Percent Reduction
Cattle Direct Deposit	2.26E+13	0.00	100
Wildlife Direct Deposit	4.11E+12	1.03E+12	75
Straight Pipes	8.38E+13	0.00	100
Barren	6.30E+12	1.26E+11	98
Commercial	3.00E+12	6.00E+10	98
Cropland	2.92E+15	5.48E+12	99
Forest	3.45E+14	1.73E+13	95

Residential	6.67E+14	1.59E+13	98
Livestock Access	7.28E+13	1.46E+11	99
Pasture	1.65E+15	3.30E+12	99
Wetlands	1.14E+12	5.70E+10	95

3) The TMDLs consider the impacts of background pollution.

The TMDLs consider the impact of background pollutants by considering the bacteria load from background sources like wildlife.

4) The TMDLs consider critical environmental conditions.

According to EPA's regulation 40 CFR 130.7 (c)(1), TMDLs are required to take into account critical conditions for stream flow, loading, and water quality parameters. The intent of this requirement is to ensure that the water quality of the impaired creeks is protected during times when it is most vulnerable.

Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards[3]. Critical conditions are a combination of environmental factors (e.g., flow, temperature, etc.), which have an acceptably low frequency of occurrence. In specifying critical conditions in the waterbody, an attempt is made to use a reasonable "worst-case" scenario condition. For example, stream analysis often uses a low-flow

(7Q10) design condition because the ability of the waterbody to assimilate pollutants without

[3]EPA memorandum regarding EPA Actions to Support High Quality TMDLs from Robert H. Wayland III, Director, Office of Wetlands, Oceans, and Watersheds to the Regional Management Division Directors, August 9, 1999.

exhibiting adverse impacts is at a minimum.

The HSPF model was run over a multi-year period to insure that it accounted for a wide range of climatic conditions. The allocations developed in the TMDLs will therefore insure that the criteria is attained over a wide range of environmental conditions including wet and dry weather conditions.

5) The TMDLs consider seasonal environmental variations.

Seasonal variations involve changes in stream flow and loadings as a result of hydrologic and climatological patterns. In the continental United States, seasonally high flows normally occur in early spring from snow melt and spring rain, while seasonally low flows typically occur during the warmer summer and early fall drought periods. Bacteria loadings also change during the year as vegetation grows and waste application rates and cattle access to the stream change seasonally. Consistent with our discussion regarding critical conditions, the HSPF model and TMDL analysis effectively considered seasonal environmental variations through the use of observed weather data over an extended period of time and modifying the waste load application rates and distribution patterns based on the time of the year.

6) The TMDLs include a margin of safety.

This requirement is intended to add a level of safety to the modeling process to account for any uncertainty. The MOS may be implicit, built into the modeling process by using conservative modeling assumptions, or explicit, taken as a percentage of the WLA, LA, or TMDL. Virginia included an implicit MOS in the TMDL through the use of conservative modeling assumptions in the determination of bacteria loadings and production.

7) There is a reasonable assurance that the TMDLs can be met.

EPA requires that there be a reasonable assurance that the TMDLs can be implemented. WLAs will be implemented through the NPDES permit process. According to 40 CFR 122.44(d)(1)(vii)(B), the effluent limitations for an NPDES permit must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the state and approved by EPA. Furthermore, EPA has authority to object to issuance of an NPDES permit that is inconsistent with WLAs established for that point source.

Nonpoint source controls to achieve LAs can be implemented through a number of existing programs such as Section 319 of the CWA, commonly referred to as the Nonpoint Source Program.

8) The TMDLs have been subject to public participation.

There were three public meetings during the development of the Tinker Creek watershed bacteria TMDL. The meetings were all noticed in the Virginia Register and subject to a thirty-

day comment period. The third public meeting was public noticed on a local cable access station and the Environmental News from the City of Roanoke. The meetings were held on February 12, 2003, June 24, 2003 and December 16, 2003. Eighteen people attended the first meeting, thirty-five people attended the second meeting and 21 people attended the third and final meeting.